3/9/00

FAX COVER SHEET

National Aeronautics and
Space Administration (NASA)
Goddard Space Flight Center (GSFC)
Code 230
Greenbelt, MD 20771
Fax: 301-286-1774

Logistics Management Division

No. pages 20 (including cover sheet)

TO: Stan Schwood

FROM: Jim Frost

DATE: 3/9/00

COMMMENTS: As expected
TAA Lams & SAAB

DTC CASE REFERRAL DOCUMENT

ADMIN USE FEB 23 2000 | DATE STAFFED: | DTC CASE TA 221 - 00

APPLICANT: LOCKHEED MARTIN VARIOUS

_____Advisory Opinion X Agreement - [Mfg], [Tech Assist], [Distribution]

_____Brokering Request

DTC CASE OFFICER: DESILVA

DTC Comments:

Recommendations and Comments Are Requested From:

☒ DTSA/LD	☐ NEA/RA	☐ PM/ECNP
☒ NASA	☐ EAP/RSP	☐ OES
☐ ENERGY	☐ EUR/RPM	☐ PM/RSAT
☐ ACDA	☐ AF/RA	☐ PM/CBM
☐ DOT/USCG	☐ ARA/PPCP	☐ DTC/CEB
☐ COMMERCE	☐ SA/RA	☐ DTC/RAB
☐ L/PM	☐ DRL/MLA	☐ PKRC
☐ _____	☐ _____	☐ _____

✓ Transmittal Letter
✓ Attachments, stated on appl
___ Tech Data/Descrip Literature
___ Statement of Work
___ Order/Ltr of Intent/Contract
✓ Copy of Agreement
___ Copy of previous Approval(s)
___ End Use Certificate/DSP-83
___ Import Authorization
___ Other (videocassette, etc)

___ Nothing

8 # of Collated Sets

REPLY HERE AND RETURN TO DEPARTMENT OF STATE, OFFICE OF DEFENSE TRADE CONTROLS, WASHINGTON, D.C. 20520-0206 Your response within 25 working days of date staffed is appreciated. PROVIDE COMMENTS FOR ANY RECOMMENDATION TO DENY OR RETURN WITHOUT ACTION (RWA).

RECOMMENDATION: ☐ APPROVE ☐ APPROVE *WITH* PROVISO ☐ DENY ☐ RWA

COMMENTS:

_____ _____

Typed/Printed NAME AND OFFICE SYMBOL Signature

DATE:_____ Telephone Number_____

Lockheed Martin Missiles & Space
1111 Lockheed Martin Way, P.O. Box 3504 Sunnyvale, California 94089-3504

In Reply Refer to P458947

PM/DTC Code 1100-12338
January 27, 2000

Mr. William J. Lowell
Director
Office of Defense Trade Controls
PM/DTC, SA-6, Rm 200
U.S. Department of State
Washington, D.C. 20522-0602

Subject: Proposed Technical Assistance Agreement between Lockheed Martin Missiles & Space and SAAB Ericsson Space AB, Sweden, and Austrian Aerospace, Austria for integration of the Swedish Global Positioning System Occultation Sensor (GPSOS).

Dear Mr. Lowell:
Submitted herewith are eight copies of this letter and nine copies of a proposed Technical Assistance Agreement between Lockheed Martin Missiles & Space (LMMS) and Saab-Ericsson Space AB, (Saab) and Austrian Aerospace - a sub-contractor to Saab - for the transfer of certain technical information and defense services. The purpose of this TAA is to allow for the exchange of technical data and defense services relating to (1) the eventual integration of the Global Positioning System Occultation Sensor (GPSOS) onto satellites of the National Polar-orbiting Operational Environmental Satellite System (NPOESS) and (2) the requirements for the retrieval of environmental parameters from GPSOS data.

Approval of the TAA is requested by March 1, 2000 in order to participate in a Technical Interchange Meeting between Saab, Austrian Aerospace, and LMMS starting on 13 March, 2000. This meeting was scheduled by the U.S. customer, IPO, because Saab and Austrian Aerospace are facing critical design issues that require input on the baseline design of the LMMS satellite proposed for NPOESS. Specific aspects of where and how to integrate the GPSOS on a satellite, need to be resolved to avoid increased costs or degraded performance in this program phase.

In accordance with 22 CFR 124.12, the following information is provided:
(a) (1) The PM/DTC applicant code is 1100-12338.

(a) (2) The licensee is Saab, located at S-405 15 Göteberg, Sweden, and Austrian Aerospace - a sub-contractor to Saab - located at Bretenfurter Strasse 106-108, A-1120 Vienna, Austria. The scope of this agreement entails Lockheed Martin Missiles

& Space exchanging data and providing defense services (see Statement of Work) with Saab and Austrian Aerospace for the integration of the GPSOS into the baseline design of an LMMS satellite for NPOESS.

No identical licensing exists for the competitive phase of the NPOESS Program. However, under the Trios/POES program, LMMS has received DTC approval for technical data and services for integration of foreign components into the LMMS TIROS/POES satellite as follows:

-TAA TA 1037-99, approved October 15, 1999 – technical data and assistance to integrate the Data collection System and Search & Rescue Processor, built by Centre National d'Etudes Spatiales (CNES), of France, with the POES Spacecraft

-TAA TA 880-99, approved September 27, 1999 – technical data and assistance for integration of the Search and Rescue Repeater built by Department of National defense, of Canada, with the POES satellites.

The agreement is valid through December 31, 2005.

(a) (3) The NPOESS program is managed by an Integrated Program Office (IPO) which is a tri-agency represented by NASA, the Department of Defense, and the Department of Commerce. The purpose of the NPOESS is to collect satellite-based global multispectral radiometry and other specialized meteorological, oceanographic, and solar-geophysical data and to disseminate the data to the program's central users and field users deployed worldwide.

There are several phases to the NPOESS program.

(I) The Development of Environmental Sensors

Beginning in 1997, the IPO issued contracts for the development of five major sensors that are to be integrated on future NPOESS satellites. An important element of the contracts is the ultimate delivery to the IPO of the sensor plus algorithms that allow environmental parameters to be retrieved from the remotely-sensed data. One of the contracts is with Saab for the development of the GPSOS and its retrieval algorithms. Saab and its subcontractor, Austrian Aerospace, will continue the development of the GPSOS during the current Phase of their contract which extends with options beyond 2005.

As required, the IPO will obtain their own import/export licensing from DTC for the delivery of the GPSOS.

(II) The Program Definition and Risk Reduction

LMMS is currently under contract - number #F04701-00-C-0501 - with the IPO. The contract is for the NPOESS Program Definition and Risk Reduction (PDRR) phase to

provide a single, national polar-orbiting remote sensing capability to acquire, receive, and disseminate global and regional environmental data. A similar competitive PDRR contract was awarded to TRW by the NPOESS IPO, and a down-select contract will be awarded to either LMMS or TRW for the Engineering and Manufacturing Development (EMD)/Production phase of the NPOESS program. One element of the PDRR contract is to reduce the risk of integrating the five NPOESS sensors onto the baseline of the LMMS satellite. The PDRR phase will end on 30 March 2002 or, if an option to the contract is exercised, on 31 December 2002.

During this phase of the contract, LMMS will develop a baseline architecture for integrating all NPOESS sensors onto a satellite. In order to develop a viable baseline, LMMS will exchange information with Saab and Austrian Aerospace on the physical, electrical, mechanical, and thermal characteristics of the GPSOS.

Similarly, during the LMMS PDRR phase of the program, Saab and Austrian Aerospace will acquire information from LMMS relating to the satellite constraints for the physical mounting of the GPSOS. The outcome of the interchange will be a satellite design that incorporates the GPSOS in a manner that is feasible, economical, and optimizes overall performance.

The primary exchange of information to be carried our under this TAA will take place during the PDRR phase of the NPOESS program - namely from 1 March 2000 through 31 December 2002.

For further information, see attached Statement of Work.

(iii) The Engineering and Manufacturing Development (EMD)/Production

The next phase in the NPOESS program, the EMD/Production, will call for the building of three satellites with an option to build four additional satellites. Although the sensor complement for each of the satellites is variable, the plan is to incorporate a GPSOS sensor on each of the seven NPOESS satellites. At an early stage in the EMD/Production phase, the IPO will transfer the responsibility for the operation, maintenance, upgrading, and performance of the sensors to the successful EMD/Production contractor; i.e. either LMMS or TRW. If selected for the EMD phase, LMMS will amend this TAA to accommodate these additional tasks.

(a) (4) The highest U.S. military security classification of the equipment or technical data to be transferred under the terms of this agreements is **UNCLASSIFIED.**

(a) (5) None of the subject matter of any of the equipment or technical data pertaining to this agreement is covered by an invention secrecy order issued by the U.S. Patent and Trademark Office.

(a) (6) The total value of the NPOESS PDRR contract to LMMS for the period from 13 December, 1999 to 30 March 2002 is $20,650,000.00; an option in the PDRR

contract includes a Preliminary Design Review with an added value of $25,600,000.00 and an extension to 31 December 2002. The estimated value of the effort to be performed under this agreement with Saab is $60,000.00 and is divided into the following items:

	Item	Estimated Value
i)	No hardware will be provided to Saab by LMMS; similarly, during the PDRR phase of the NPOESS contract; similarly, no hardware from Saab will be delivered to LMMS,	$ 0.00
ii)	Documentation of the LMMS requirements for integrating the GPSOS instrument onto an LMMS satellite will be provided,	10,000.00
iii)	No software will be provided to Saab by LMMS;	0.00
iv)	Assistance and services associated with the exchange of information to effect a workable and efficient configuration of the GPSOS on the LMMS satellite will be provided by LMMS.	50,000.00
	Total for this effort	**$60,000.00**

(a) (7) No foreign military sales credits or loan guarantees are or will be involved in financing the agreement.

(a) (8) Not applicable.

(a) (9) Not applicable.

(b) (1) If the agreement is approved by the Department of State, such approval will not be construed by Lockheed Martin Missiles & Space as passing on the legality of the agreement from the standpoint of antitrust laws or other applicable statutes, nor will Lockheed Martin Missiles & Space construe the Department's approval as constituting either approval or disapproval of any of the business terms or conditions between the parties to the agreement.

(b) (2) Lockheed Martin Missiles & Space will not permit the proposed agreement to enter into force until it has been approved by the Department of State.

(b) (3) Lockheed Martin Missiles & Space will furnish the Department of State with one copy of the signed agreement within 30 days from the date that the agreement is concluded and will inform the Department of its termination not less than 30 days prior to the expiration and provide information on the continuation of any foreign rights or the flow of technical data to the foreign party. If a decision is made not to conclude the

agreement, Lockheed Martin Missiles & Space will so inform the Department within 60 days.

(b) (4) This agreement grants the right to sub-license. Prior to the release of any technical data, Saab and/or Austrian Aerospace will execute a Non-Disclosure Agreement (NDA) incorporating all of the provisions of the basic agreement which refer to the U.S. Government and the Department of State (i.e., 22 CFR 124.8 and/or 124.9). Copies of the executed NDAs, referencing this agreement by number, will be maintained by Lockheed Martin Missiles & Space for five years from the expiration of the agreement.

To facilitate U.S. Government consideration of this request, the agreement contains the following provisions currently required by the ITAR:

Pursuant to 22 CFR 124.7:

CFR Section	Agreement Reference
124.7(1)	Paragraph 3I(1)
124.7(2)	Paragraph 3I(2)
124.7(3)	Paragraph 3I(3)
124.7(4)	Paragraph 3I(4)

Pursuant to 22 CFR 124.8:

CFR Section	Agreement Reference
124.8(1)	Paragraph 3II(1)
124.8(2)	Paragraph 3II(2)
124.8(3)	Paragraph 3II(3)
124.8(4)	Paragraph 3II(4)
124.8(5)	Paragraph 3II(5)
124.8(6)	Paragraph 3II(6)

No defense articles will be shipped in furtherance of this agreement. Only technical data and other defense services will be provided.

Pursuant to 22 CFR 121.16, the items intended for export in connection with this agreement are not identified in the MTCR.

Pursuant to 22 CFR 123.15 and 124.11, the items intended for export in connection with this agreement do not require Congressional Notification.

This agreement relates to the following U.S. Munitions List categories:
Category XV Space Systems and Associated Equipment (c), (e), and (f).

A Nontransfer and Use Certificate, Form DSP-83, as required for SME, classified articles or classified technical data is not attached in accordance with 22 CFR 124.10.

The following U.S. Government agency is familiar with the items intended for export in connection with this agreement:

IPO: NPOESS Integrated Program Office
E/IP Centre Building
8455 Colesville Rd, Suite 1450
Silver Spring, Md 20910

The contact person at the IPO is: Mr. Craig Nelson, (phone: 301-427-2070)

The parties WILL NOT utilize a Lockheed Martin International field office to support the efforts undertaken under this agreement.

As currently envisioned, Lockheed Martin Missiles & Space does not anticipate any requirement to export or import any hardware or software in connection with this agreement. Should such a requirement arise, a DSP-5 application citing this agreement and/or a request for an amendment to this agreement will be submitted to your office.

The NPOESS Program does not involve the release of any USG telemetry, encryption, COMSEC, TRANSEC data or systems. none of this information will be transferred in any manner with Saab or Austrian Aerospace.

LMMS technical point of contacts are:
Jeff Smith: 408-743-1476 Ron Harten: 408-756-2325

If you require other information relating to this agreement please contact the undersigned at (408) 742-3816 or Mr. Matt Doyle in our Crystal City office at (703) 413-5674.

Sincerely,

John L. Callan
Director
Export/Import Compliance & Administration
Empowered Official

Attachments:
Letter of Transmittal, original and 8 copies
Proposed Agreement (with Statement of Work), 9 copies
Freight Forwarders Sheet, 9 copies
22 CFR 126.13 Certification Letter, original and 1 copy
Precedent Licensing – DTC approved TAAs TA 1037-99 and 880-99
Technology Transfer Control Plan

TECHNICAL ASSISTANCE AGREEMENT

BETWEEN

LOCKHEED MARTIN MISSILES & SPACE

AND

SAAB-ERICSSON SPACE AB, Sweden,

And

AUSTRIAN AEROSPACE, Austria

This Agreement is entered into between Lockheed Martin Corporation, a corporation of the State of Maryland, for its division Lockheed Martin Missiles & Space (hereinafter referred to as "LMMS") with offices at 1111 Lockheed Martin Way, P.O. Box 3504, Sunnyvale, California, United States of America, 94089-3504, and Saab-Ericcson AB (hereinafter referred to as "Saab") whose office is situated at S-405 15 Göteberg, Sweden, and Austrian Aerospace whose office is situated at Bretenfurter Strasse 106-108, A-1120 Vienna, Austria, and is effective upon the date of signature of the last party to sign the Agreement. LMMS, Saab, and Austrian Aerospace are hereinafter referred to as the Parties.

WHEREAS, LMMS desires to exchange technical data and provide defense services to Saab and Austrian Aerospace relating to (1) the requirements to integrate the Global Positioning System Occultation Sensor (GPSOS) onto the LMSS baseline satellite for the National Polar-orbiting Operational Environmental Satellite System (NPOESS) and (2) the requirements to evaluate the performance of the algorithms for the retrieval of environmental parameters, and

WHEREAS, LMMS is under contract (Number F04701-00-C-0501) with the Integrated Program Office comprised of Department of Commerce, NASA and the Department of Defense (see Statement of Work), and

WHEREAS, the IPO will obtain their own import and export licensing from the Department of State as required, and

WHEREAS, Saab is under contract with the IPO to provide both the GPSOS and its retrieval algorithms for environmental parameters, and

WHEREAS, Austrian Aerospace is under a sub-contract to Saab to help in the development of the hardware for the GPSOS, and

WHEREAS, it is the intent of the IPO to provide the GPSOS to the contractor (LMMS or TRW) selected for the Engineering and Manufacturing Development phase of NPOESS, and

WHEREAS, Saab and Austrian Aerospace desire to receive technical data and defense services related to the integration of the GPSOS and its retrieval algorithms onto the LMMS baseline satellite designed for NPOESS,

NOW THEREFORE, the parties desire to enter into this Technical Assistance Agreement as follows:

1. This Technical Assistance Agreement is intended to enable LMMS to perform defense services and disclose technical data during the Program Definition and Risk Reduction (PDRR) Phase in support of the requirements to integrate the GPSOS sensor onto the baseline NPOESS satellites and to evaluate the requirements for the retrieval of environmental parameters from the GPSOS.

There are several phases to the NPOESS program.

(I) The Development of Environmental Sensors

Beginning in 1997, the IPO issued contracts for the development of five major sensors that are to be integrated on future NPOESS satellites. An important element of the contracts is the ultimate delivery to the IPO of the sensor plus algorithms that allow environmental parameters to be retrieved from the remotely-sensed data. One of the contracts is with Saab for the development of the GPSOS and its retrieval algorithms. Saab and its subcontractor, Austrian Aerospace, will continue the development of the GPSOS during the current Phase of their contract which extends with options beyond 2005.

(II) The Program Definition and Risk Reduction

LMMS is currently under contract - number #F04701-00-C-0501 - with the IPO. The contract is for the NPOESS Program Definition and Risk Reduction (PDRR) phase to provide a single, national polar-orbiting remote sensing capability to acquire, receive, and disseminate global and regional environmental data. A similar competitive PDRR contract was awarded to TRW by the NPOESS IPO, and a down-select contract will be awarded to either LMMS or TRW for the Engineering and Manufacturing Development (EMD)/Production phase of the NPOESS program. One element of the PDRR contract is to reduce the risk of integrating the five NPOESS sensors, including GPSOS, onto the baseline of the LMMS satellite. The PDRR phase will end on 30 March 2002 or, if an option to the contract is exercised, on 31 December 2002.

The primary exchange of information to be carried our under this TAA will take place during the PDRR phase of the NPOESS program - namely from 1 March 2000 through

31 December 2002. The exchange of data includes the requirements for (1) spacecraft to GPSOS instrument interface specifications, (2) test plans and procedures specific to the GPSOS interface and instrument performance, and (3) interface drawings and analysis for instrument specific mechanical, thermal, electrical, data processing, flight software and fields-of-view analysis (optical, radio frequency, and thermal). In addition, the expected performance of the algorithms to retrieve environmental parameters using data from the GPSOS is required information to be provided by Saab to LMMS.

(iii) The Engineering and Manufacturing Development (EMD)/Production

The next phase in the NPOESS program, the EMD/Production, will call for the building of three satellites with an option to build four additional satellites. Although the sensor complement for each of the satellites is variable, the plan is to incorporate a GPSOS sensor on each of the seven NPOESS satellites. At an early stage in the EMD/Production phase, the IPO will transfer the responsibility for the operation, maintenance, upgrading, and performance of the sensors to the successful EMD/Production contractor; i.e. either LMMS or TRW. If selected for the EMD phase, LMMS will amend this TAA to accommodate these additional tasks.

2. It is understood that this Technical Assistance Agreement is entered into as required under U.S. Government regulations and, as such, it is an independent agreement between the parties, the terms of which will prevail, notwithstanding any conflict or inconsistency that may be contained in other arrangements between the Parties on the subject matter.

3. The parties agree to comply with all applicable sections of the International Traffic in Arms Regulations (ITAR) of the U.S. Department of State and that, more particularly, in accordance with such regulations the following conditions apply to this Agreement:

I. ITAR 124.7

(1) Data to be exchanged includes that necessary to integrate a GPSOS instrument and its retrieval algorithms with an NPOESS baseline spacecraft. Such data includes the requirements for (1) spacecraft to instrument interface specifications, (2) test plans, procedures and resulting data specific to the instrument interface and instrument performance, and (3) interface drawings and analysis for instrument specific mechanical, thermal, electrical, data processing, flight software and fields-of-view analysis (optical, radio frequency, and thermal) (see attachment A, Statement of Work).

All technical data and defense services transferred by Saab and Austrian Aerospace to LMMS under this agreement pertains solely to the performance of retrieval algorithms and the interface between the LMMS architecture of the baseline spacecraft and the GPSOS instrument and does not represent a transfer of technical data or defense services specific to the design, manufacture, assembly or test of the NPOESS

spacecraft itself. LMMS will transfer to Saab and Austrian Aerospace software interface specifications pertaining to GPSOS specific flight software data processing and ground support. No LMMS software code or algorithms will be exchanged.

As currently envisioned, LMMS does not anticipate any requirement to export LMMS owned hardware in connection with this agreement however, a GPSOS instrument and associated Saab- owned special test equipment may be returned to the NPOESS IPO.

(2) The technical assistance and data to be provided under this agreement includes all tasks associated with (1) the requirements for the GPSOS algorithms for the retrieval of environmental parameters, and (2) the specifications for receiving, inspecting, bench level testing, installing on the baseline spacecraft, aligning on the baseline spacecraft, functionally verifying the instrument-to-spacecraft interface via spacecraft level testing and storing. Additionally, LMMS will assist Saab in establishing the methodology for the review of instrument level and spacecraft level interface test data and anomaly resolution as required.

(3) The agreement is valid through 31 December 2005.

(4) The effort intended to be accomplished under this agreement will take place in Sweden, Austria, or the United States of America. There is no other country or area in which manufacturing, processing, sale or other form of transfer is to be licensed.

II. ITAR 124.8

(1) This Agreement shall not enter into force and shall not be amended or extended without the prior written approval of the Department of State of the U.S. Government.

(2) This Agreement is subject to all United States laws and regulations relating to exports and to all administrative acts of the U.S. Government pursuant to such laws and regulations.

(3) The Parties to this Agreement agree that the obligations contained in this Agreement shall not affect the performance of any obligations created by prior contracts or subcontracts which the Parties may have individually or collectively with the U.S. Government.

(4) No liability will be incurred by or attributed to the U.S. Government in connection with any possible infringement of privately owned patent or proprietary rights, either domestic or foreign, by reason of the U.S. Government's approval of this Agreement.

(5) The technical data or defense service exported from the United States in furtherance of this Agreement and any defense article which may be produced or manufactured from such technical data or defense service may not be transferred to a person in a third country or to a national of a third country except as specifically authorized in this Agreement unless the prior written approval of the Department of State has been obtained.

(6) All provisions in this Agreement which refer to the United States Government and the Department of State will remain binding on the Parties after the termination of the Agreement.

4. It is understood that disclosure of information by Saab to LMMS is subject to any rules, restrictions or laws of Sweden. It is understood that disclosure of information by Austrian Aerospace to LMMS is subject to any rules, restrictions or laws of Austria.

5. Technical data relating to this program may be exchanged with Saab and/or Austrian Aerospace contractors/subcontractors provided that, prior to the release of any technical data, Saab executes a Non-Disclosure Agreement (NDA) with each company. The NDA will incorporate all of the provisions of the basic Agreement which refer to the U.S. Government and the Department of State (i.e., 22 CFR 124.8 and/or 124.9). Copies of the executed NDAs referencing this Agreement by number will be provided to and maintained by LMMS for five years from the expiration of the Agreement.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed effective as of the day and year above provided.

Lockheed Martin Missiles & Space
By _____

Printed Name _____

Title _____

Date _____

Saab-Ericsson Space AB
By _____

Printed Name _____

Title _____

Date _____

Austrian Aerospace
By _____

Printed Name _____

Title _____

Date _____

Attachment A

STATEMENT OF WORK

Between

Lockheed Martin Missiles & Space (LMMS)

And

Saab-Ericsson Space AB, Sweden,

And

Austrian Aerospace, Austria

For the
Global Positioning System Occultation Sensor (GPSOS)

TABLE OF CONTENTS

1.0 INTRODUCTION

This Technical Assistance Agreement is intended to enable LMMS to perform defense services and disclose technical data during the Program Definition and Risk Reduction (PDRR) Phase in support of the requirements to integrate the GPSOS sensor onto the baseline NPOESS satellites and to evaluate the requirements for the retrieval of environmental parameters from the GPSOS.

There are several phases to the NPOESS program.

(I) The Development of Environmental Sensors
Beginning in 1997, the IPO issued contracts for the development of five major sensors that are to be integrated on future NPOESS satellites. An important element of the contracts is the ultimate delivery to the IPO of the sensor plus algorithms that allow environmental parameters to be retrieved from the remotely-sensed data. One of the contracts is with Saab for the development of the GPSOS and its retrieval algorithms. Saab and its subcontractor, Austrian Aerospace, will continue the development of the GPSOS during the current Phase of their contract which extends with options beyond 2005.

(II) The Program Definition and Risk Reduction
LMMS is currently under contract - number #F04701-00-C-0501 - with the IPO. The contract is for the NPOESS Program Definition and Risk Reduction (PDRR) phase to provide a single, national polar-orbiting remote sensing capability to acquire, receive, and disseminate global and regional environmental data. A similar competitive PDRR contract was awarded to TRW by the NPOESS IPO, and a down-select contract will be awarded to either LMMS or TRW for the Engineering and Manufacturing Development (EMD)/Production phase of the NPOESS program. One element of the PDRR contract is to reduce the risk of integrating the five NPOESS sensors, including GPSOS, onto the baseline of the LMMS satellite. The PDRR phase will end on 30 March 2002 or, if an option to the contract is exercised, on 31 December 2002.

The primary exchange of information to be carried our under this TAA will take place during the PDRR phase of the NPOESS program - namely from 1 March 2000 through 31 December 2002. The exchange of data includes the requirements for (1) spacecraft to GPSOS instrument interface specifications, (2) test plans and procedures specific to the GPSOS interface and instrument performance, and (3) interface drawings and analysis for instrument specific mechanical, thermal, electrical, data processing, flight software and fields-of-view analysis (optical, radio frequency, and thermal). In addition, the expected performance of the algorithms to retrieve environmental parameters using data from the GPSOS is required information to be provided by Saab to LMMS.

(iii) The Engineering and Manufacturing Development (EMD)/Production

The next phase in the NPOESS program, the EMD/Production, will call for the building of three satellites with an option to build four additional satellites. Although the sensor complement for each of the satellites is variable, the plan is to incorporate a GPSOS sensor on each of the seven NPOESS satellites. At an early stage in the EMD/Production phase, the IPO will transfer the responsibility for the operation, maintenance, upgrading, and performance of the sensors to the successful EMD/Production contractor; i.e. either LMMS or TRW. If selected for the EMD phase, LMMS will amend this TAA to accommodate these additional tasks.

2.0SCOPE

The scope of this effort during the PDRR phase of the LMMS contract with the IPO, consists of Lockheed Martin Missiles and Space (LMMS) exchanging technical date and providing defense services to Saab Ericsson Space AB (Saab) and Austrian Aerospace necessary for the development of the Global Position System Occultation Sensor (GPSOS). The GPSOS is currently under development by Saab and Austrian Aerospace through a contract with the Integrated Program Office of the United States Government. The work will enable LMMS, Saab, and Austrian Aerospace to disclose technical data and provide defense services in support of (1) the integration of the GPSOS instrument onto the baseline architecture of the LMMS satellite that is proposed for the National Polar-orbiting Operational Environmental Satellite System (NPOESS) and (2) the evaluation of the GPSOS algorithms for the retrieval of environmental parameters.

3.0 OBJECTIVE

The objective of the efforts is to exchange technical date and provide defense services associated with installing the GPSOS on an LMMS baseline spacecraft. The work includes information on the requirements for (1) the alignment of the GPSOS on the spacecraft, (2) functionally verifying the instrument-to-spacecraft interface, and (3) verifying the performance to retrieve environmental data from simulated GPSOS data.

Such technical data to be exchanged includes, but is not limited to (1) spacecraft to instrument interface specifications, (2) test plans and procedures specific to the instrument interface and instrument performance, (3) interface drawings and analysis for instrument specific mechanical, thermal, electrical, data processing, flight software and fields-of-view analysis (optical, radio frequency, and thermal), and (4) algorithms for the retrieval of environmental parameters.

4.0 TASK DESCRIPTIONS

The following services and technical data are required in order to support (1) the integration of the Saab/Austrian Aerospace GPSOS instrument on the baseline architecture of the LMMS satellite for the NPOESS program and (2) the evaluation of the algorithms for the retrieval of environmental parameters.

4.1 LMMS Interface Specifications and Drawings Applicable to GPSOS

4.1.1 Description

Review all Saab and Austrian Aerospace GPSOS inputs to the draft Unique Instrument Interface Control Document (ICD) and the General Instrument Interface Specification (GIIS).

The task will include the following:

- Review the Saab and Austrian Aerospace inputs to the Interface Control Documents and confirm that the Interfaces are compatible with the baseline architecture of the LMMS NPOESS satellite,
- Review all interface drawings and analyses - prepared with joint input by LMMS, Saab, and Austrian Aerospace - applicable to GPSOS; these include:
  - Mechanical interfaces,
  - Thermal interfaces,
  - Electrical interfaces,
  - Fields-of-view (optical, thermal, and radio frequency), and spacecraft configuration

4.1.2 Approach

- LMMS will analyze all GPSOS interface documents and ensure that the interfaces are consistent with the requirements of the LMMS NPOESS satellite
- LMMS will interface directly with Saab and Austrian Aerospace personnel to resolve any discrepancies between the proposed GPSOS interfaces and the LMMS satellite
- LMMS will document their evaluation of the interface documents

4.1.3 Schedule

The review of the interface documents will occur between March and December of 2000.

4.2 Test Plans and Procedures Applicable to GPSOS

4.2.1 Description

Review all Saab and Austrian Aerospace GPSOS test plans and procedures that are applicable to GPSOS

The task will include the requirements for the following tests and procedures:

- Instrument bench tests
- Spacecraft interface tests
- Spacecraft level tests
- Spacecraft environmental tests
- GPSOS instrument installation procedures

4.2.2 Approach

- LMMS will analyze all proposed test plans and procedures that relate to the integration of the GPSOS onto an LMMS satellite
- LMMS will interface directly with Saab personnel to resolve any discrepancies between the proposed GPSOS tests and LMMS standard procedures
- LMMS will document their evaluation of test procedures

4.2.3 Schedule

The review of the interface documents will occur between March 2000 and March of 2001.

4.3 Software Specifications applicable to GPSOS

4.3.1 Description

Review Saab software specifications applicable to GPSOS

The task will include reviews of the following software specifications:

- Specifications of the ground processing of the GPSOS sensor data
- Interface specific flight software specifications

4.3.2 Approach

- LMMS will analyze the specifications of the ground processing of data received from the GPSOS instrument
- LMMS will *review and analyze* the software specifications for flight software between the GPSOS instrument and the LMMS baseline satellite

4.3.3 Schedule

The review of the interface documents will occur between March 2000 and December 2001.

4.4 Host or Attend Meetings for the Exchange of Technical GPSOS Data

4.4.1 Description

Attend technical interchange meetings involving GPSOS

The task will include participation in the following types of reviews

- Design reviews
- Technical Interchange Meetings (TIMs)
- Test support reviews
- GPSOS and LMMS satellite baseline data
- On-orbit anomaly review and resolution

4.4.2 Approach

- At the request of the NPOESS Integrated Program Office, LMMS will attend reviews and technical interchange meetings that are required to coordinate the integration of the GPSOS sensor onto an LMMS baseline spacecraft.

4.4.3 Schedule

Interface meetings between Saab, Austrian Aerospace, and LMMS will occur between March 2000 and December 2002.

5.0 DELIVERABLES

Reports of the major interchange meetings will be delivered to the NPOESS IPO within 30 days of each meeting. The first meeting is scheduled for March 13, 2000. Subsequent interchange meetings are planned at approximately six-month intervals through December 2002.

LOCKHEED MARTIN

TAA between Lockheed Martin Missiles & Space, SAAB Ericsson Space AB, Sweden, and Austrian Aerospace, Austria

Lockheed Martin Corporation
PM/DTC Applicant Code: 1100-12338
Date: January 28, *1999*

Names and addresses of all U.S. consignors and freight forwarders who may be involved in this transaction:

1. UNISTAR Air Cargo
377 Swift Avenue
South San Francisco, CA 94080

2. Expeditors International
578 Eccles Ave.
South San Francisco, CA 94080

3. TNT Skypack
875 Stanton Road
Burlingame, CA 94010

4. DHL Airways, Inc.
1346 Bordeaux Dr.
Sunnyvale, CA 94089

5. American Airlines
875 Mahler Road, Suite 248
Burlingame, CA 94010

6. Consolidated Freightways
390 Commercial St.
San Jose, CA 95012

7. Burlington Air Express
342 Allerton Ave.
South San Francisco, CA 94080

8. Federal Express
1286 Lawrence Station Rd.
Sunnyvale, CA 94089

9. Air Canada
Cargo Building No. 7
San Francisco, CA 94128

10. Emery Worldwide
601 S. Airport Blvd.
South San Francisco, CA 94080

11. United Airlines
San Francisco Int'l Airport
San Francisco, CA 94128

12. Schenkers Int'l Agencies
380 Littlefield Ave.
South San Francisco, CA 94080

13. EAC Steamship Agencies
201 Spear St., Suite 200
San Francisco, CA 94015

14. Air Express International
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15. Express Freight International
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16. Hand Carry
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